On February 12, 2005, paper machine No. 1 started up at the new Adolf Jass Schwarza mill in Rudolstadt/Thüringen, Germany. It set a new world record for packaging board machines straightaway, with a start-up speed of 1,105 m/min at 100 g/m² basis weight. This new greenfield mill will produce up to 400,000 t.p.a. of corrugating medium and testliner at 75-125 g/m² basis weight, using 100 % recovered paper.

Complete PM 1 line delivered by Voith Paper

Voith Paper delivered the entire process technology for this new production line – from stock preparation to winder including automation components – based on the One Platform Concept. The Voith scope of supply also included the initial start-up clothing according to the Voith Paper Fabrics Multi Platform concept, which helped to ensure a successful start-up in all sections.

The MultiForm A forming fabric qualities proved themselves, with a very stable start-up behaviour and dependable response. These innovative high-tech forming fabrics, a state-of-the-art Voith Paper Fabrics development, help toward the ongoing optimization of high speed paper machines and modern cleaning systems.
Focus on customer benefit

Already at the planning stage, this new installation took account of the latest packaging machine experiences from well-known reference installations. Both the customer and Voith paid great attention to using well-proven technology. The entire packaging paper machine is the first one ever to be designed in "industrial design" throughout.

Stock preparation

The stock preparation system is designed for a total capacity of 1,300 t/24 h finished stock based on 100% recovered paper. Voith supplied the entire stock preparation equipment, from bale dewiring and charging, pulping and high consistency cleaning, hole screening, fractionation, long and short fiber cleaning, long fiber screening as well as thickening, through to process water and rejects handling technology.

Recovered paper is fed into the stock preparation system via a bale dewirer and charging system with a capacity of around 120 bales per hour, supplied by Voith Paper Euskirchen. The dewired bales are fed to the main highlight of the stock preparation system, the TwinDrum pulping system (Fig. 1). This TwinDrum pulper at Jass Schwarza has the largest capacity among TwinDrums installed so far. The raw material is then passed via high consistency cleaning to a 3-stage pre-screening system (MSM MultiSorter and Combisorter with cleaner) for effective pre-screening.

After pre-screening, the stock is fractionated into short and long fiber fractions in an MSF MultiFractor. The long and short fiber components are subsequently cleaned in 3-stage EcoMizer cleaner systems (Fig. 2). The long fiber fraction is...
additionally screened in a 3-stage slot screening arrangement. Both fiber components are then thickened in Voith Bagless disc filters.

Voith’s joint-venture partner meri supplied the entire rejects handling equipment, including metal detection and magnetic separation, coarse and fine shredding and compactors. For effluent treatment meri’s proven Deltapurge and Elephant machines have been selected. Sludge pre-thickening is via a Bluedrain gravity table. A high efficiency sludge screw press (Fig. 5) – an entirely new product development from Voith – is installed directly after Bluedrain.

This clearly defined stock preparation concept has enabled the mill to successfully reach its goals of gentle pulping and earliest possible contaminant removal from the stock suspension.

**Approach flow, whitewater circuit and broke handling**

The Advanced Wet End Process has been fully implemented here. Voith’s proven ComMix and HydroMix mixing components have been installed in the approach flow with the result that an improvement in web profile stability has been confirmed. VoithVac full-flow deaeration is installed for both the top- and backliner (Fig. 6).

Directly ahead of the headbox, Multi-Screen MSA screens are in operation for both the top- and for the backliner. These not only ensure excellent hydraulic stability, they also provide optimum screening-out characteristics. There are no fiber losses in the approach flow, since the screen rejects are fed back to stock preparation. This patented Voith process sets new standards in efficiency and economy.

Four CP CompactPulpers handle the paper machine broke which is then returned to the stock preparation system. This ensures the paper machine is always fed with optimally prepared stock. Any contaminants in the broke are thus removed before they can interfere with paper machine runnability or product quality.

The scope of stock preparation supply also included water management and engineering consultant services for the engineering partner appointed by Jass, as...
Technical data

<table>
<thead>
<tr>
<th>Machine</th>
<th>PM 1</th>
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</thead>
<tbody>
<tr>
<td>Untrimmed width</td>
<td>7,600 mm</td>
</tr>
<tr>
<td>Design speed</td>
<td>1,500 m/min</td>
</tr>
<tr>
<td>Grade</td>
<td>Corrugating medium and testliner</td>
</tr>
<tr>
<td>Basis weight</td>
<td>75-125 g/m²</td>
</tr>
<tr>
<td>Production capacity (gross)</td>
<td>1,300 t/24 h</td>
</tr>
</tbody>
</table>

**Paper machine**

Sheet formation takes place in a DuoFormer Base specially designed for high-speed packaging paper production. The drainage section, comprising a vacuum-augmented forming roll followed by a curved top wire suction box, ensures excellent formation with good retention values.

The MasterJet M2 headbox is fitted with the well-proven OnQ ModuleJet dilution water control system. This two-layer headbox guarantees the best possible utilization of strength potential, while at the same time ensuring optimal economical furnish use. In the headbox nozzle the two layers are separated by a stiff lamella, thus allowing different jet-wire speeds. Basis weight CD-profile control is by a Profilmatic dilution water control on the back layer. Thanks to the uniformly controlled basis weight profile, optimal paper quality is attained at an early stage in the production process. Both tools are very valuable for strength optimization.

In the press section, a DuoCentri-NipcoFlex press with a shoe press in the third nip ensures optimal runnability. High quality roll covers are used here, such as the MagnaPress II, Aqualis and Cerlease SDe. After the press, optimal dryness and moisture profile are guaranteed by the zone-controlled OnQ ModuleSteam blow box on the double suction press roll with Profilmatic control software. Local drainage is improved by the OnQ ModuleSteam unit, which also eliminates any moisture streaks in the web CD-profile before reaching the dryer section. The MultiFlex O3 felt for pickup and first nip, MultiFlex D2 as bottom felt and MultiFlex V3 for the third press are the optimal selection for the DuoCentri-NipcoFlex press. Right from start-up, the results were excellent drainage efficiency with high wear resistance.

The entire pre-dryer section is designed according to the TopDuoRun concept, comprising six single-tier dryer groups with 31 drying cylinders in total. ProRelease boxes in the first two dryer groups ensure excellent runnability at low basis weights and highest operating
When did you first think about building a new plant here in Rudolstadt? And what were the reasons?

Jass-Teichmann: Just after the turn of the millennium we started thinking about expanding our company by building a new paper mill. Then as now and in the foreseeable future, we have to meet the steep growth in market demand for lightweight testliner and corrugating medium. We chose Rudolstadt/Schwarza as a location for various reasons.

First, we have an outstandingly good infrastructure here. The site is next to the river Saale. Not far away are a power station and an industrial effluent treatment plant, and soon there will also be an incineration plant. Furthermore, we also have an on-site rail connection. Second, Rudolstadt is centrally situated in Germany and Europe – like our parent mill in Fulda. It is excellent positioned logistically with regard to the rapidly growing East European markets. And with Fulda only about 170 km away, we can specialize each of our three paper machines for specific basis weight ranges. This enables us to serve our customers with optimal paper quality as well as fast and reliable deliveries. That would not be possible if we had built our new mill a long way away to serve a single regional market.

Why did you place this order with Voith Paper?

Prinzhorn: We have a long and reliable partnership with Voith. Back in the nineties Voith handled the complete rebuild and expansion of both our paper machines in Fulda. The great success of those projects alone proved Voith’s outstanding competence. Another reason for placing the Schwarza PM 1 order was Voith’s already well-proven know-how on high speed paper machine technology for lightweight corrugating medium and testliner.

What is your opinion of Voith’s project handling and cooperation?

Jass-Teichmann: For good reasons, we decided to place the order on an all-inclusive basis. Voith’s scope of supply covered the entire production line, from recovered paper bale handling and dewiring on one end, to the winder on the other end. By minimizing the number of interfaces involved, this certainly speeded up the project, so that we had paper on reel only 14 months after starting construction work.

Voith’s outstanding dependability is matched by its unsurpassed technical competence. Another important point for us is the Voith support after the commissioning, so that together, we can optimize this machine for maximum performance.

What has been your experience since the start-up on February 12, 2005?

Jass-Teichmann: In the night of the start-up we made a toast of a steep start-up curve – and it is indeed steep. Only eight months after commissioning, we regularly run the machine at speeds of 1,250 to 1,300 m/min. And the design capacity of 1,300 t per day has already been exceeded several times: our newest record is 1,463 t. In other words, we are pleased to say that everything is proceeding very satisfactorily.

Your PM 1 is one of the world’s most modern and fastest packaging paper machines. Is the latest paper machine technology a must for your product quality?

Prinzhorn: As mentioned, we use our PM 1 to meet the new and growing market demand for lightweight packaging grades. With these basis weights of 70-100 g/m² for corrugating medium and 90-120 g/m² for testliner, appropriate new technology concepts were indispensable to meet product requirements for cross-profile stiffness (SCT) and highest
possible homogeneity. Lightweight paper production also demands much higher machine speeds to ensure the high outputs required for cost-effectiveness as against conventional production lines. Furthermore, the entire technological concept of the stock preparation line and paper machine must reduce the otherwise greater sheet brake risk at low basis weights.

You are one of the largest producers of corrugating medium in Germany. What does the future hold for Jass? What are your goals?

Jass-Teichmann: We think Schwarza PM 1 will be operated at design capacity by 2007 at the latest. In other words, together with our two paper machines in Fulda we shall be producing around 900,000 t.p.a. of corrugating medium liner by then. Our market share in Germany will then be about 20%. Our goals for the future are to go on creating a market advantage for our customers with absolutely first-class product quality and reliable deliveries. And for our employees to enjoy working in a family-owned enterprise on state-of-the-art technology.

Many thanks indeed for this interview – and congratulations on your new production line!

speeds. They provide a controlled web transfer from drying cylinder to dryer fabric thanks to a special high-vacuum zone. The after-dryer section is a combination of a TopDuoRun with four single-tier dryer groups combined with one double-tier CombiDuoRun dryer group. Thanks to the separate heating of top and bottom drying cylinder, perfect sheet flatness can be attained. Five DuoCleaner Express units are installed for efficient dryer fabric cleaning.

Uniform and faultless starch application is ensured by a Speedsizer with state-of-the-art Voith roll covers. Large diameter rods are used here for the first time. Carbon fiber blade beams enable starch application at very high temperatures. A Voith Krieger Airturn ensures optimal contactless web transfer from the Speedsizer to the after-dryer section. The entire dryer section is equipped with a ropeless tail transfer system, while Fibron transfer equipment is used in the Speedsizer and Sirius reel areas.

Paper coming from the after-dryer section is wound up on a Sirius reel, equipped with center drive and integrated RollMaster hardness control – to a maximum diameter of 4,400 mm. The reel turn up is carried out with a EcoChange W automatically – the web is cut with a high-pressure water jet.

The OnV machine monitoring system covers the pulper drives, the approach flow section and the entire paper machine. By giving early warning of imminent bearing failure, the monitoring system improves the runnability of PM 1 as a whole. OnV machine monitoring is also a valuable tool for optimizing maintenance shutdown planning.

Winder

A single VariFlex L two-drum winder handles the entire output thanks to its high performance – in particular featuring a high degree of automation, operating speeds up to 2,800 m/min, high acceleration and deceleration rates, flying splice at the unwind, and extremely fast set-change times.

Successful commissioning

The successful commissioning of this entire production line – well before the agreed deadline – is thanks to the outstanding teamwork distinguishing this large project. Congratulations are due to all concerned, particularly to the Jass Schwarza team for its highly professional and efficient project leadership.